



Deceleration Subsystem (DSS) Ares I-X Main Parachute Fabrication: Pioneer Aerospace Corporation has just completed fabrication of the third and final Ares I-X 150-foot diameter main parachute at their Columbia, MS plant ahead of schedule. The parachute is being shipped this week to the Kennedy Space Center (KSC) for delivery to USA. Since the original Ares I-X main parachute installation date has shifted and this parachute is being delivered early, USA now may have time to pack and deliver all three of the new Ares I-X main parachutes rather than using one of the unused main parachutes from our drop test program.



Parachute fabrication at the Mississippi facility

Recent activities specific to the Elements include:

- **Upper Stage (US)**

- **Upper Stage Integrated Test Subsystem:** Crew Launch Vehicle (CLV)/US review was held last week on the plans to design and construct a test fixture for the US common bulkhead proof pressure test. A common bulkhead proof pressure test fixture will be needed initially for conducting the Common Bulkhead Structural Development Damage Tolerance test (designated SD19) in the mid-2010 timeframe. During the review, the decision was made to design the proof fixture so that liquid hydrogen will be utilized as the pressurization medium on the cold (hydrogen) side of the common bulkhead and heated gaseous nitrogen will be used to pressurize the warm (oxygen) side. This decision will allow this same fixture to be used for both SD19 testing purposes and subsequent standard common bulkhead acceptance testing purposes, as needed. The team will also be investigating the possibility of conducting the acceptance proof pressure testing for common bulkheads that are manufactured at the Michoud Assembly Facility (MAF) at the NASA Stennis Space Center (SSC). SSC is not far from MAF and already has infrastructure in place for liquid hydrogen testing.

CLV/US Structural Development test efforts are continuing for the small panel aluminum-lithium buckling tests (designated SD01) in Building 4619 at MSFC. On August 27, the first test of a transverse grain direction orthogrid pattern test panel was completed successfully. Buckling occurred at a load close to 300,000 lb, which was close to predictions. All previous SD01 panel tests were conducted with panels fabricated so the longitudinal grain direction was loaded. This testing confirmed that the aluminum-lithium structural properties (moduli of elasticity) are similar in both grain directions, which was anticipated. Four more panels



remain to be tested for SD01. The next panel to be tested will be the first one to have an isogrid reinforcing rib design. All remaining panels are scheduled to be completed by October 2008, which will complete the SD01 test series. Next year, larger aluminum-lithium panel tests are planned, which are designated SD02.

- **Flight and Integrated Test Office (FITO) and Ares I-X**
 - **Ares I-X Roll Control System (RoCS) Element:** Activities specific to the RoCS Element include:
 - Comments have been received against Deviation Requests and are being dispositioned: 0167 – No Vibro-Acoustics Acceptance Testing Planned for Flight Components or Assemblies, 0168 – Maximum Expected Operating Pressure (MEOP) Pressure Testing Levels on the Propellant Filter Assemblies, and 0171 – No Vibro-Acoustics Qualification Testing Planned for Pyro Valves and Ordnance.
 - Roll control system panels were received at Teledyne after being match drilled at Glenn Research Center. The spare undrilled panel has also been received.
 - The outer installation table (ground support equipment) was painted and assembled.
 - The orifice flow bench pump was received and installed, which leads to preparation for cold flow tube pressure drop and orifice sizing tests. Welding and non-destructive evaluation was completed on all cold flow unit tubing.
 - An Engineering Change Order was processed for the fairing and RoCS structure for developmental flight instrumentation location changes.
 - Roll control system Operational Test Requirements changes were presented and approved at the Ares I-X Control Board (XCB).

The Ares Project looks forward to the kick-off of the Upper Stage Engine Critical Design Review (CDR) and the Ares I Preliminary Design Review (PDR) Board next week.

...and as of this Ares Projects Weekly Summary, there are only 222 days until the first Ares I test flight, Ares I-X!!!